O-0605
EXTINGUISH A SMALL FIRE

CONDITIONS

You have come across a small fire.

OBJECTIVES

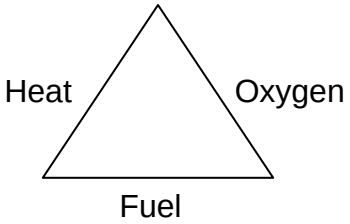
Safely extinguish the fire.

TRAINING AND EVALUATION

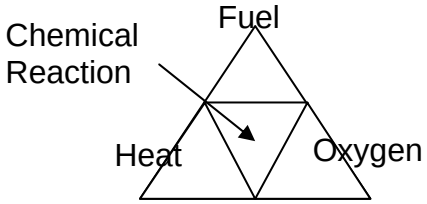
Training Outline

1. Fire burns in two basic modes: flaming and surface combustion (or smoldering). The surface or smoldering fire is represented by the fire triangle with the three sides representing fuel, heat and oxygen. Flaming combustion is represented by the fire tetrahedron (pyramid) with the four sides representing fuel, heat, oxygen and an uninhibited chemical chain reaction.

Fire Triangle



Fire Pyramid (unfolded)



2. The fuel portion of either type of fire may be solid, liquid or gas. Oxygen may be that present in the air or in another solid, liquid or gaseous chemical which contains oxygen (an oxidizer). Combustion (fire) starts when there is the proper mixture of oxidizer, fuel and either heat or a chemical reaction.

3. To extinguish a fire, the triangle or pyramid must be broken by:

a. removing the fuel or

b. removing the oxygen or

c. reducing the heat or

d. interfering with the chemical reaction.

4. The most common method of extinguishing a fire is by reducing the heat, in other words, cooling the fire, using water. This is most effective on common combustibles such as wood and paper.

5. Cooling will not work on flammable liquids such as gasoline and grease. To extinguish fires such as these, the fuel must be removed (such as closing a valve to stop the flow), displacing the oxygen (with a non-flammable gas for instance), or breaking up the chemical reaction with another chemical.

6. Fires are divided into four classes and fire extinguishers are classified the same to indicate what type of fire they are effective against:

a. Class A - Common combustibles such as wood, paper, cloth and many plastics. Water works well on these by cooling them below their ignition points.

b. Class B - Flammable liquids and gases. These must be extinguished by smothering (removing the oxygen), displacing the oxygen, removing the fuel or breaking up the chemical reaction.

c. Class C - Fires involving energized electrical equipment. Although there are special extinguishing agents for these, it is normally easiest to de-energize the circuit (turn off the power), then put out the resulting Class A or B fire.

d. Class D - Flammable metals. These are rare and require special techniques to extinguish.

7. Fire extinguishers also have a numerical rating which indicates the relative size fire it will extinguish. A 4A extinguisher will put out a Class A fire twice as big as a 2A extinguisher can and 4 times the size that a 1A extinguisher can extinguish.

8. The most common type of extinguisher is an ABC, with the most versatile being a 4A-20B:C (the C has no rating, it just indicates that the extinguishing agent is non-conductive). This type of extinguisher is effective against most small fires in a home or vehicle.

9. To use a fire extinguisher:

a. Make sure it is appropriate to the type of fire: A, B or C.

b. Make sure the fire is small. This means that if the extinguisher fails to put out the fire, you must be able to safely escape. If in doubt, retreat and call 9-1-1.

c. Start on the upwind side of the fire.

d. Follow the letters **PASS**:

P = PULL the pin at the top of the extinguisher that keeps the handle from being pressed. There is usually a wire or plastic tab that keeps the pin from falling out. This can easily be broken just by pulling on the pin. Then check the gauge. If it does not show a full charge, it should not be used because the effectiveness may be greatly degraded.

A = AIM the nozzle towards the fire. If the nozzle is at the end of a hose attached to the body of the extinguisher, detach the hose before aiming the nozzle.

S = SQUEEZE the handle to discharge the extinguishing agent. Use long or short bursts depending on the fire size and location, aiming at the base of the fire. Carefully move closer if the stream does not reach the fire.

S = SWEEP the extinguishing stream along the base of the fire. On liquid or grease fires, sweeping just above the liquid is important, otherwise the burning liquid may be spread around further. Move closer to the fire as it goes out, circling it if necessary.

1) The discharge may only last 30 seconds at the most, so have another extinguisher at the ready or plan to abandon the effort if the fire is not out.

2) Make sure the fire is out and be prepared for flare-ups.

3) If you don't know what is burning, don't attempt to put out the fire.

4) Don't attempt to extinguish hazardous material fires.

5) Approach burning vehicles from an angle, not head on or in direct line with the tires. When opening the hood of a vehicle with an engine fire, open it slightly, spray some extinguishing agent in, then open the hood the rest of the way. Be prepared for flare ups or a flashover.

6) If any doubt exists before or after a fire, notify authorities.

10. To extinguish an outdoor fire such as a campfire or small brushfire:

a. Keep upwind of the fire

b. Have all personnel, vehicles and equipment ready to clear out quickly.
Use water if available. Do not use the drinking water supply if it cannot be easily replenished.

c. Splash, spray or sprinkle water onto the fire, do not pour it on all at once. As the water is put on the fire, break up big pieces of material if possible, spread out any burning or smoldering material, turning it over to ensure that all areas are wetted. Continue to add water while disturbing the material until all signs of flame and glowing embers are extinguished. Dig up or overturn the soil under the burned area to try to mix the ashes into the soil.

d. Using care, place your hand close to the burned area to ensure that it is cool. If not, add more water and continue disturbing the material until it is cool.

e. After the fire is out and cool, ensure the burned material is adequately mixed in with the soil.

f. Be prepared for flare-ups.

g. If water is not available, or in combination with water if it is, throw soil, sand, etc. onto the fire while breaking up, spreading around and disturbing the burning material, mixing it in with the soil.

h. Blankets, coats, shelter halves or similar objects of heavy fabric, not plastic or synthetic, can be used to extinguish flames by beating directly on the flames to smother them. This must be done directly on the flames, otherwise this action will fan the flames, causing the fire to grow in intensity. This technique can also be used in combination with water, and the objects should be wetted if it is.

i. Campfires, signal fires and warming fires must always be completely extinguished and cool to the touch before leaving them.

j. Efforts to extinguish a brushfire should only be attempted if the fire is very small, there is little or no wind and an escape route is planned. If in doubt, retreat and notify authorities.

Additional Information

More detailed information on this topic is available in Chapter 9 of the Ground Team Member & Leader Reference Text.

Evaluation Preparation

***Setup*:** This exercise should be conducted with a fire protection agency. These agencies will provide instruction and in most cases, will have a safe area and supplies for igniting training fires and have fire extinguishers for students to use.
Establish a safe area away from combustibles with backup or alternate extinguishing methods to the one(s) the students will use. Have a fireproof container in which a small, controlled fire can be ignited, sufficient fuel to ignite a fire for each student to extinguish an ignition source(s).
NOTE: Fire protection personnel should start the fire and have the student extinguish the fire just built, but should also be prepared to put out the fire if necessary.

***Brief student*:** Prior to igniting the test fire, the student is to list the four components necessary for fire, what the basic requirement is to extinguish a fire, the four classes of fire, the types of materials each represents and how to select the correct extinguisher for each, explain PASS, and list two safety considerations before attempting to extinguish a fire. Ignite a fire and have the student extinguish it.

Evaluation

Performance Measures	Results	
1. Lists fuel, oxygen (oxidizer), heat and chemical reaction as the four components necessary for fire.	P	F
2. Explains the basic requirement to extinguish a fire is to remove one of the components necessary for fire.	P	F
3. Lists Class A, B, C, D fires.	P	F
4. Lists the type of material each type of fire represents.	P	F
5. Explains that the fire extinguisher selected must have the same letter type as the class of fire to be extinguished.	P	F
6. Explains each letter in PASS.	P	F
7. Lists two safety precautions prior to extinguishing a fire (stay upwind, fire must be small, be prepared for flare-ups, etc.)	P	F
8. Safely extinguishes a small fire using an extinguisher or technique appropriate to the type of test fire.	P	F

Student must receive a pass on all performance measures to qualify in this task. If the individual fails any measure, show what was done wrong and how to do it correctly.